

Claims:

1. A method of controlling birefringence in a rib waveguide structure manufactured in silicon, the rib waveguide structure comprising an elongated rib element having an upper face and two side faces, the method comprising:

forming a blanket layer of silicon nitride to a predetermined thickness over said rib waveguide structure directly abutting said upper face and side faces.

2. A method according to claim 1, wherein the blanket layer of silicon nitride extends over the substrate flanks on either side of the rib waveguide structure.

3. A method of controlling birefringence in a rib waveguide structure manufactured in silicon, the rib waveguide structure comprising an elongated rib element having an upper face and two side faces, the method comprising:

growing a layer of oxide over the upper face and side faces;

stripping the oxide layer to reveal the upper face and side faces; and

forming a layer of silicon nitride to a predetermined thickness over said rib waveguide structure directly abutting said upper face and side faces.

4. Use of a layer of silicon nitride in a method of fabricating a rib waveguide structure in silicon to control birefringence by depositing said layer to a predetermined thickness over said rib waveguide structure.

5. A method of manufacturing a silicon rib waveguide structure comprising:

forming an elongated rib element in a silicon substrate, the elongated rib element having an upper face and two side faces; and

forming a layer of silicon nitride to a predetermined

thickness over said elongated rib element directly abutting said upper face and side faces, the predetermined thickness being selected such as to control birefringence in the rib waveguide structure.

6. A method of manufacturing a silicon rib waveguide structure, the method comprising:

forming an elongated rib element having an upper face and two side faces in a silicon substrate;

growing a layer of oxide over the upper face and side faces;

stripping the oxide layer to reveal the upper face and side faces; and

forming a layer of silicon nitride to a predetermined thickness over said rib waveguide structure directly abutting said upper face and side faces.

7. A silicon rib waveguide structure comprising an elongated rib element having an upper face and two side faces formed of silicon and a layer of silicon nitride directly abutting said upper face and side faces and having a predetermined thickness selected to control birefringence in the silicon rib waveguide structure.

8. A method or structure according to any preceding claim, wherein the predetermined thickness of the layer of silicon nitride is 1000A for a waveguide structure having a width of 3-5 microns.

9. An evanescent coupler structure comprising first and second silicon rib waveguides each comprising an elongated rib element having an upper face and two side faces formed of silicon and a layer of silicon nitride directly abutting said upper face and side faces and having a predetermined thickness selected to control birefringence in the evanescent coupler.

10. A structure according to claim 7, 8 or 9, wherein the blanket layer of silicon nitride extends over the substrate flanks on either side of the rib waveguide structure.

11. A method or structure according to any preceding claim wherein the waveguide structure is manufactured on a silicon-on-insulator wafer.